2001 Energy

An Energy Efficiency Workshop & Exposition

Kansas City, Missouri

Sensitivity Training – ESPC Style
The Scenario Builder Story

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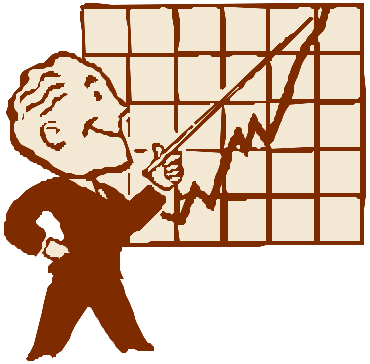
FEMP
FEDERAL ENERGY MANAGEMENT PROGRAM

NREL

Scenario Builder

- What is IT?
- How can I get IT?
- What will IT do for me?

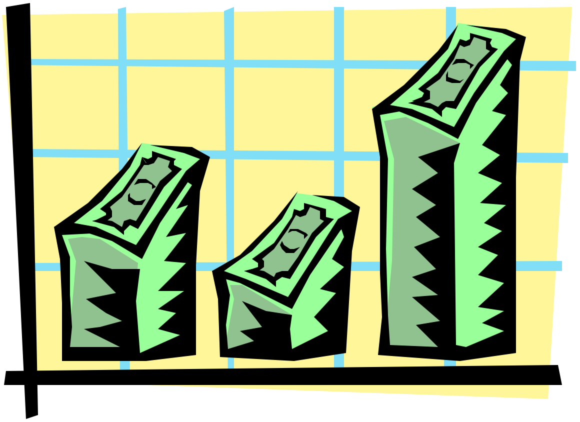


Scenario Builder Goals

- Ease of Input
- Single Point of Entry
- Flexible Project Parameters
- Immediate Output Response
- Parameter Warnings
- Output Summary Page

Anticipated Uses

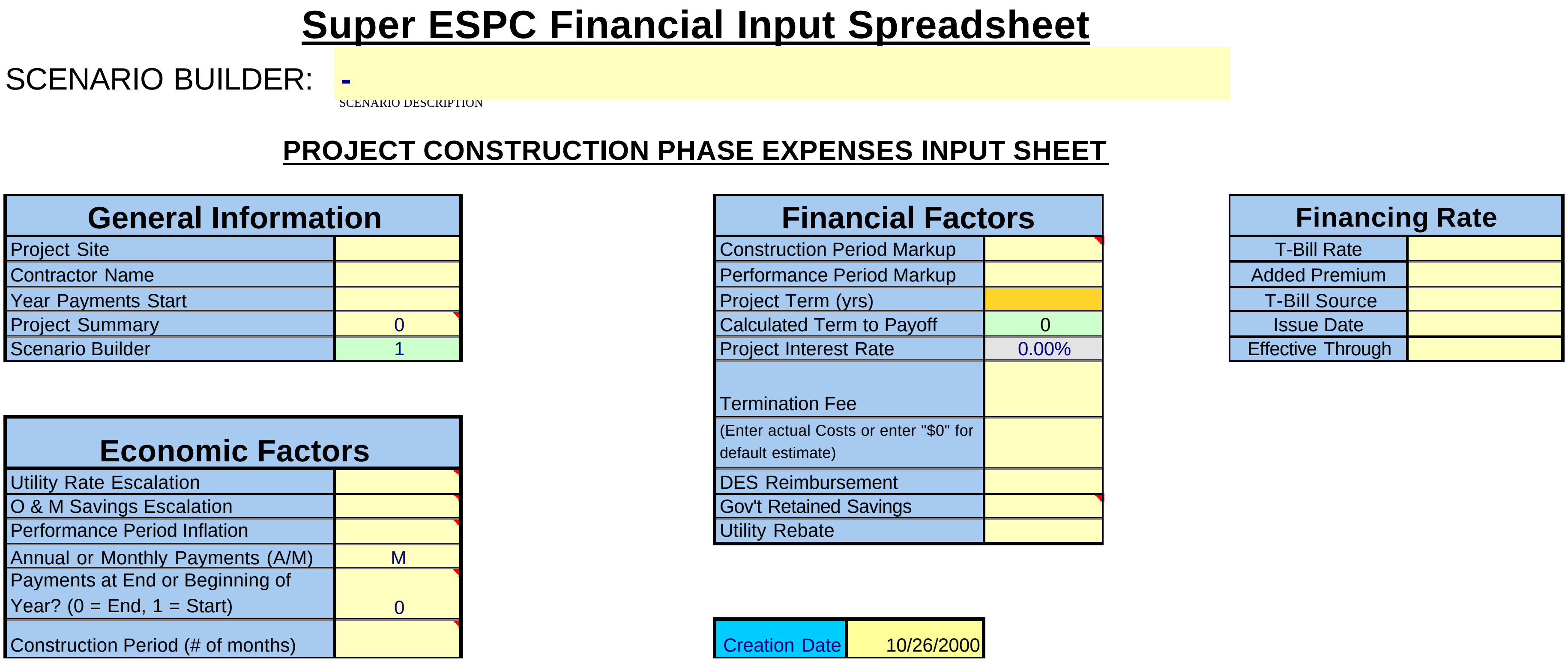
- Development of what if scenarios
- Proposal Value Checking
- Cost/Benefit Analysis



SB Main Sections

- Input Sheet
- Project Summary
- Project Schedules

Input Sheet



Super ESPC Financial Input Spreadsheet

SCENARIO BUILDER: -

SCENARIO DESCRIPTION

PROJECT CONSTRUCTION PHASE EXPENSES INPUT SHEET

General Information	
Project Site	
Contractor Name	
Year Payments Start	
Project Summary	0
Scenario Builder	1

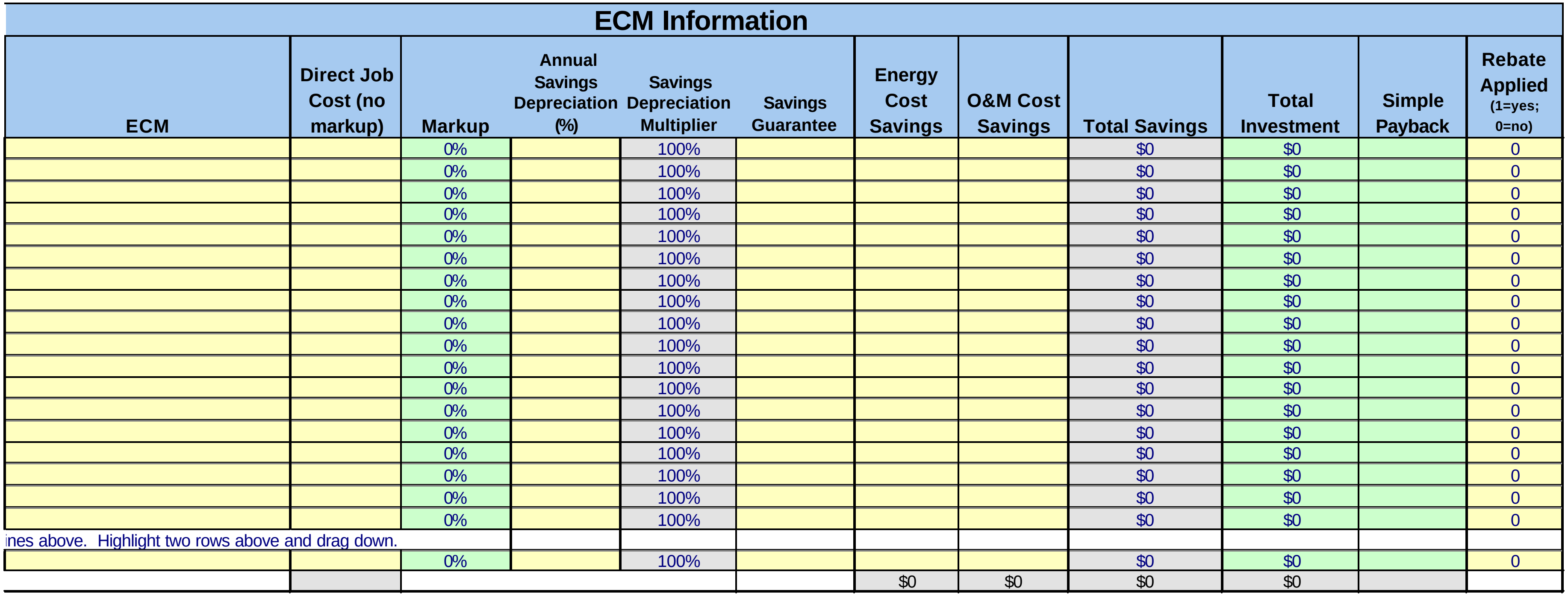
Economic Factors	
Utility Rate Escalation	
O & M Savings Escalation	
Performance Period Inflation	
Annual or Monthly Payments (A/M)	M
Payments at End or Beginning of Year? (0 = End, 1 = Start)	0
Construction Period (# of months)	

Financial Factors	
Construction Period Markup	
Performance Period Markup	
Project Term (yrs)	
Calculated Term to Payoff	0
Project Interest Rate	0.00%
Termination Fee	
(Enter actual Costs or enter "$0" for default estimate)	
DES Reimbursement	
Gov't Retained Savings	
Utility Rebate	

Financing Rate	
T-Bill Rate	
Added Premium	
T-Bill Source	
Issue Date	
Effective Through	

Creation Date	10/26/2000

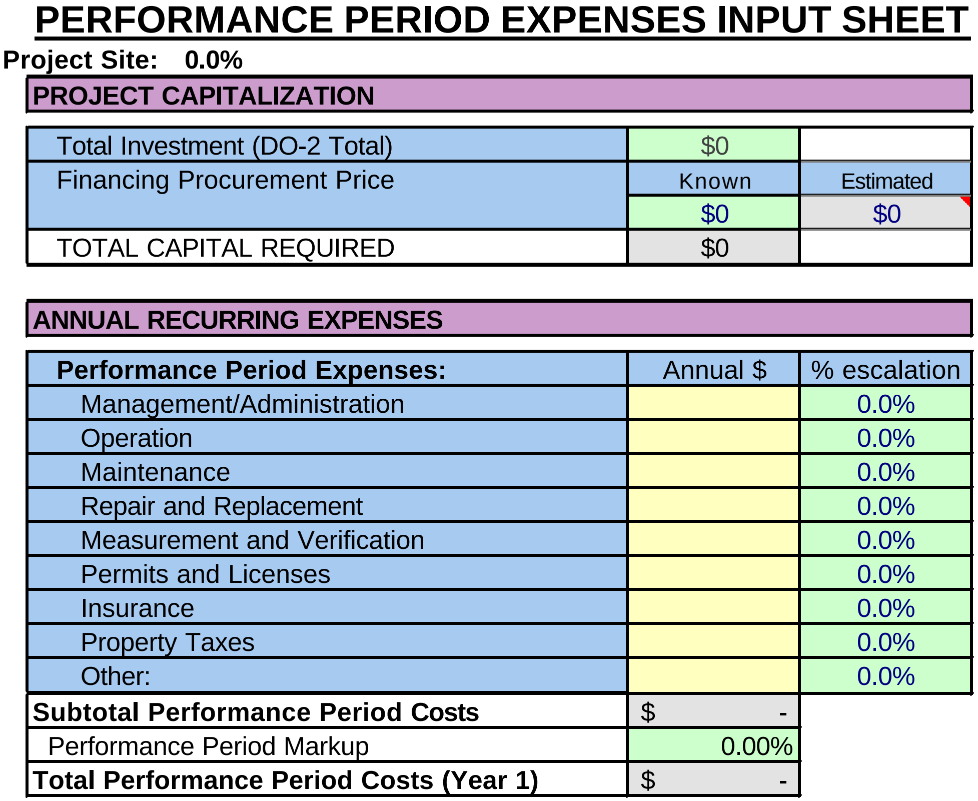
Input Sheet – cont.



ECM Information

ECM	Direct Job Cost (no markup)	Markup	Annual Savings Depreciation (%)	Savings Depreciation Multiplier	Savings Guarantee	Energy Cost Savings	O&M Cost Savings	Total Savings	Total Investment	Simple Payback	Rebate Applied (1=yes; 0=no)
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
		0%		100%				$0	$0		0
ines above. Highlight two rows above and drag down.											
		0%		100%				$0	$0		0
						$0	$0	$0	$0		

Input Sheet – cont.



PERFORMANCE PERIOD EXPENSES INPUT SHEET

Project Site: **0.0%**

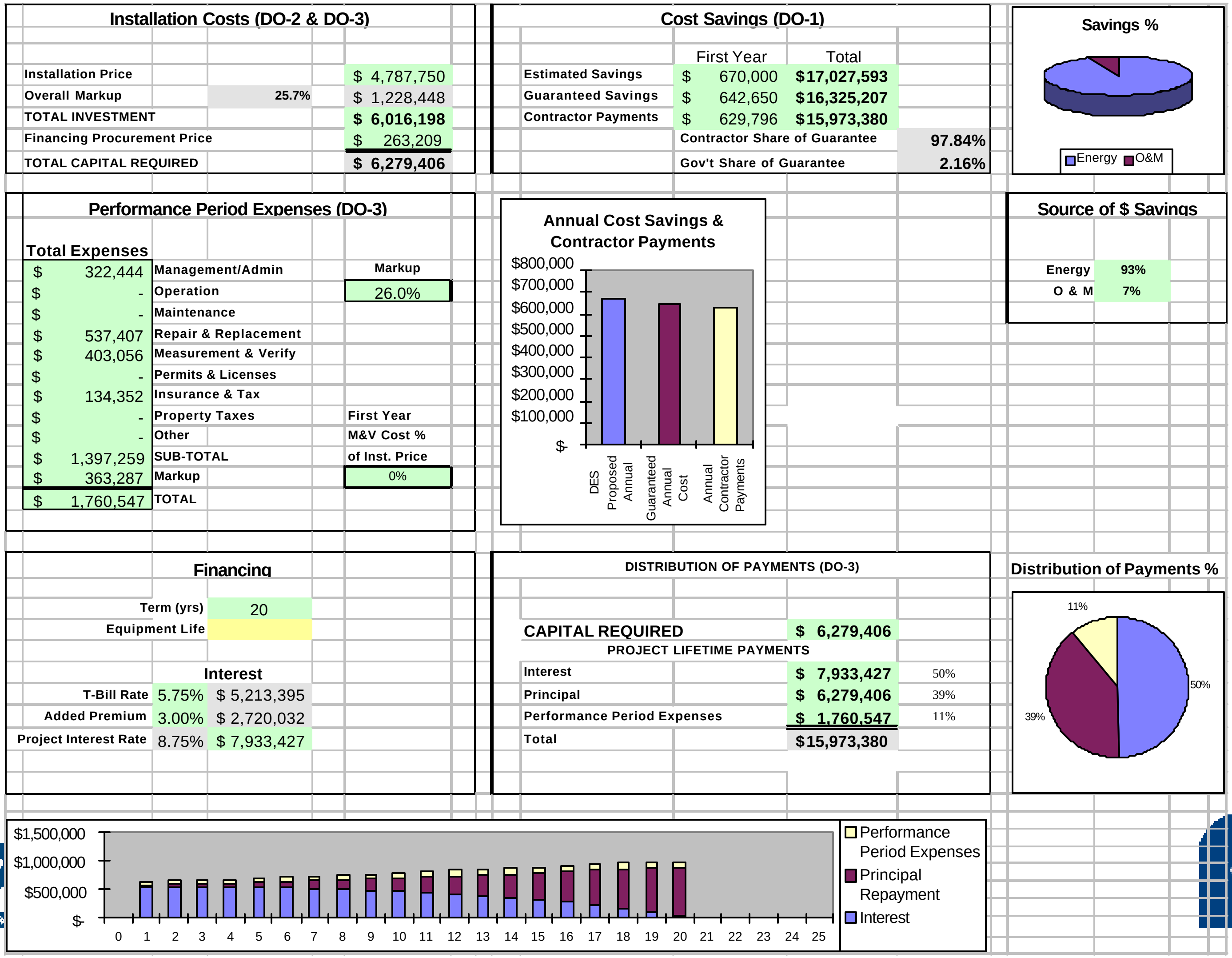
PROJECT CAPITALIZATION

Total Investment (DO-2 Total)	$0	
Financing Procurement Price	Known	Estimated
	$0	$0
TOTAL CAPITAL REQUIRED	$0	

ANNUAL RECURRING EXPENSES

Performance Period Expenses:	Annual $	% escalation
Management/Administration		0.0%
Operation		0.0%
Maintenance		0.0%
Repair and Replacement		0.0%
Measurement and Verification		0.0%
Permits and Licenses		0.0%
Insurance		0.0%
Property Taxes		0.0%
Other:		0.0%
Subtotal Performance Period Costs	$ -	
Performance Period Markup	0.00%	
Total Performance Period Costs (Year 1)	$ -	

Project Summary Page



Installation Costs (DO-2 & DO-3)

Installation Price		$ 4,787,750
Overall Markup	25.7%	$ 1,228,448
TOTAL INVESTMENT		$ 6,016,198
Financing Procurement Price		$ 263,209
TOTAL CAPITAL REQUIRED		$ 6,279,406

Cost Savings (DO-1)

	First Year	Total
Estimated Savings	$ 670,000	$17,027,593
Guaranteed Savings	$ 642,650	$16,325,207
Contractor Payments	$ 629,796	$15,973,380

Contractor Share of Guarantee	97.84%
Gov't Share of Guarantee	2.16%

Savings %

Performance Period Expenses (DO-3)

Total Expenses		
$ 322,444	Management/Admin	Markup
$ -	Operation	26.0%
$ -	Maintenance	
$ 537,407	Repair & Replacement	
$ 403,056	Measurement & Verify	
$ -	Permits & Licenses	
$ 134,352	Insurance & Tax	
$ -	Property Taxes	First Year
$ -	Other	M&V Cost %
$ 1,397,259	SUB-TOTAL	of Inst. Price
$ 363,287	Markup	0%
$ 1,760,547	TOTAL	

Annual Cost Savings & Contractor Payments

$800,000
$700,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$-
DES Proposed Annual
Guaranteed Annual Cost
Annual Contractor Payments

Source of $ Savings

Energy	93%
O & M	7%

Financing

Term (yrs)	20	
Equipment Life		
		Interest
T-Bill Rate	5.75%	$ 5,213,395
Added Premium	3.00%	$ 2,720,032
Project Interest Rate	8.75%	$ 7,933,427

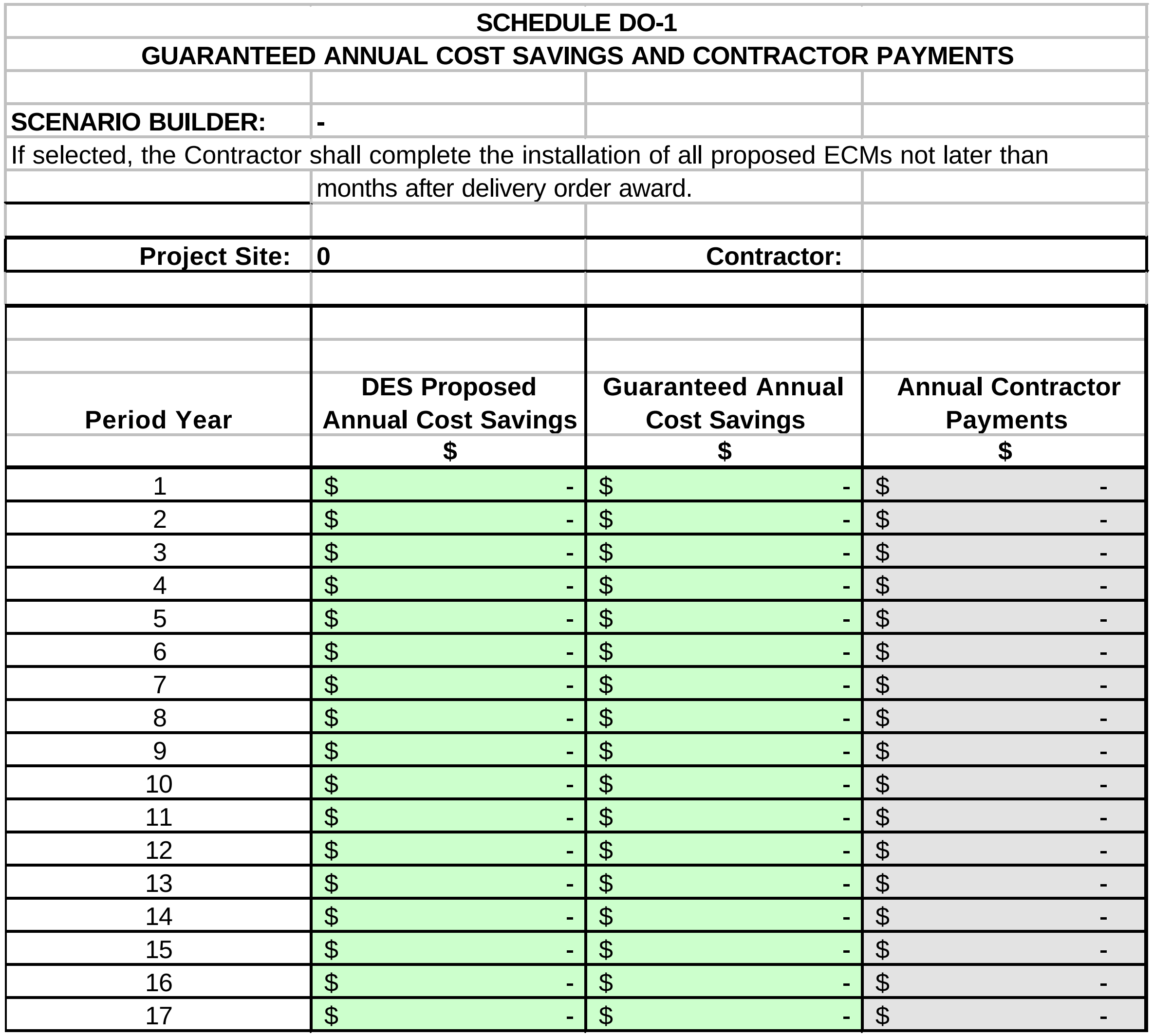
DISTRIBUTION OF PAYMENTS (DO-3)

CAPITAL REQUIRED	$ 6,279,406	
PROJECT LIFETIME PAYMENTS		
Interest	$ 7,933,427	50%
Principal	$ 6,279,406	39%
Performance Period Expenses	$ 1,760,547	11%
Total	$15,973,380	

Distribution of Payments %

$1,500,000
$1,000,000
$500,000
$-
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
Performance Period Expenses
Principal Repayment
Interest

DO Schedule 1 Output



SCHEDULE DO-1

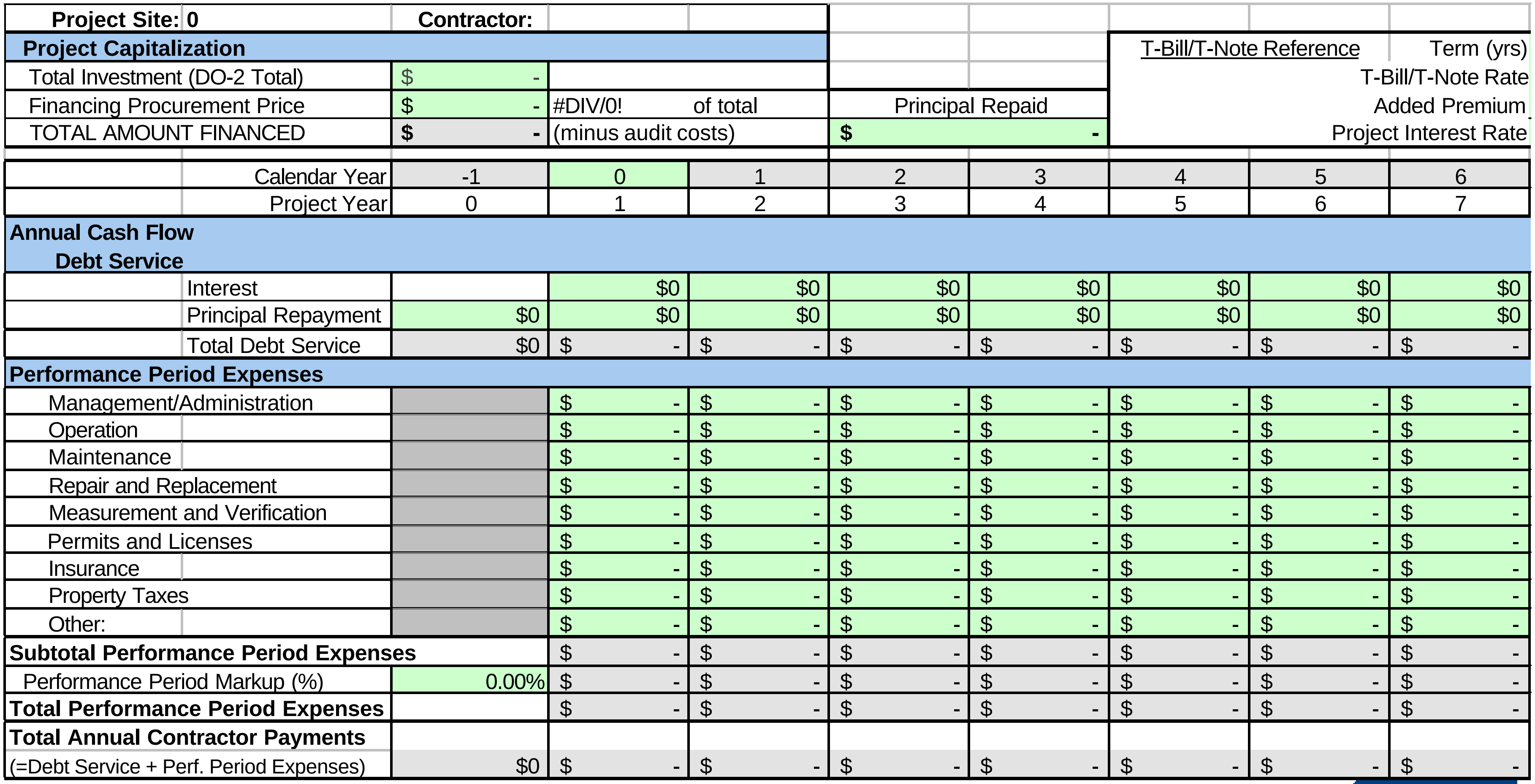
GUARANTEED ANNUAL COST SAVINGS AND CONTRACTOR PAYMENTS

SCENARIO BUILDER: **-**

If selected, the Contractor shall complete the installation of all proposed ECMs not later than ______ months after delivery order award.

Project Site:	**0**	**Contractor:**	
Period Year	**DES Proposed Annual Cost Savings $**	**Guaranteed Annual Cost Savings $**	**Annual Contractor Payments $**
1	$ -	$ -	$ -
2	$ -	$ -	$ -
3	$ -	$ -	$ -
4	$ -	$ -	$ -
5	$ -	$ -	$ -
6	$ -	$ -	$ -
7	$ -	$ -	$ -
8	$ -	$ -	$ -
9	$ -	$ -	$ -
10	$ -	$ -	$ -
11	$ -	$ -	$ -
12	$ -	$ -	$ -
13	$ -	$ -	$ -
14	$ -	$ -	$ -
15	$ -	$ -	$ -
16	$ -	$ -	$ -
17	$ -	$ -	$ -

DO Schedule 3 Output

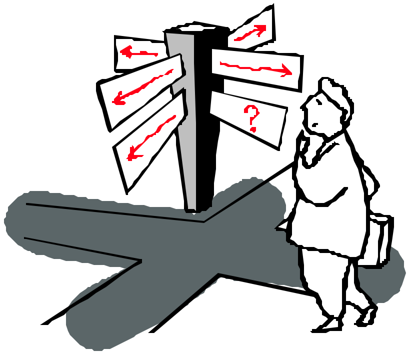


Project Site: 0	**Contractor:**			
Project Capitalization				T-Bill/T-Note Reference Term (yrs)
Total Investment (DO-2 Total)	$ -			T-Bill/T-Note Rate
Financing Procurement Price	$ -	#DIV/0! of total	Principal Repaid	Added Premium
TOTAL AMOUNT FINANCED	**$ -**	(minus audit costs)	**$ -**	Project Interest Rate

Calendar Year	-1	0	1	2	3	4	5	6
Project Year	0	1	2	3	4	5	6	7
Annual Cash Flow								
Debt Service								
Interest		$0	$0	$0	$0	$0	$0	$0
Principal Repayment	$0	$0	$0	$0	$0	$0	$0	$0
Total Debt Service	$0	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Performance Period Expenses								
Management/Administration		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operation		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Maintenance		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Repair and Replacement		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Measurement and Verification		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Permits and Licenses		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Property Taxes		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other:		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subtotal Performance Period Expenses		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Performance Period Markup (%)	0.00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Performance Period Expenses		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Annual Contractor Payments (=Debt Service + Perf. Period Expenses)	$0	$ -	$ -	$ -	$ -	$ -	$ -	$ -

What if options

- ECM add / remove
- Interest Rate Changes
- Contractor Markup Changes
- Project Term Changes



Cost/Benefit Analysis

- Interest Rate Impacts
- Contractor Markup Impacts
- Negotiation Strategies
- Project Bundling

Interest Rate Sensitivity Study

- Project Size - $6,279,406
- Annual Costs - $65,520
- Interest Rate – 8.75%
- Contractor Markup – 29% / 26%
- Interest Costs - $7,933,427
- Project Term – 20 years
- Simple Payback – 9 years

Interest Rate Sensitivity Study

	Term	Interest Costs	Change from Base
Plus 1%	25	$ 12,234,963	$ 4,301,536
Plus .5%	22	$ 9,687,482	$ 1,754,055
Base Case	20	$ 7,933,427	$ -
Minus .5%	19	$ 6,629,430	$ (1,303,997)
Minus 1%	18	$ 5,610,693	$ (2,322,734)

Contractor Markup Study

	Term	Interest Costs	Change from Base
Plus 2%	21	$ 8,467,880	$ 534,453
Plus 1%	21	$ 8,195,289	$ 261,862
Base Case	20	$ 7,933,427	$ -
Minus 1%	20	$ 7,681,566	$ (251,861)
Minus 2%	20	$ 7,439,207	$ (494,220)

Scenario Builder Future

- Simple Life Cycle Costing Analysis
- Better Variable Payment Control
- User Friendly Interface
- Variable Escalation Rates

Questions?